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COMMITTEE OF EXPERTS ON THE
TRANSPORT OF DANGEROUS GOODS

Sub-committee of Experts on the
Transport of Dangerous Goods

REPORT OF THE SUB-COMMITTEE OF EXPERTS ON ITS EIGHTH SESSION (Geneva, 22 - 30 November 1993)

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REPORT

ATTENDANCE

1. The Sub-Committee of Experts on the Transport of Dangerous Goods held its eighth session from 22 to 30 November 1993. The session was attended by experts from the following countries: Canada; China; France; Germany; Italy; Japan; Netherlands; Norway; Poland; Russian Federation; Sweden; United Kingdom; United States of America. Observers from the European Community (EC), Argentina, Australia, Austria, Belgium, Brazil, Finland, Mexico, Spain, and Switzerland participated in accordance with Rule 72 of the Rules of Procedures of the Economic and Social Council. Representatives of the United Nations Environment Programme (UNEP) as well as the following specialized agencies and intergovernmental organizations attended the session: International Labour Organization (ILO); International Civil Aviation Organization (ICAO); International Maritime Organization (IMO); Central Office for International Railway Transport (OCTI). Representatives of the European Liquefied Petroleum Gas Association (AEGPL), the International Chamber of Shipping (ICS), the International Organization for Standardization (ISO), the International Air Transport Association (IATA), the International Road Transport Union (IRU), the European Chemical Industry Council (CEFIC), the Hazardous Materials Advisory Council (HMAC), the European Secretariat of Manufacturers of Light Metal Packagings (SEFEL) took part in the discussions when items of concern to their organizations were considered. The secretariat of the Organization for Economic Co-operation and Development (OECD) was also present at the invitation of the secretariat.

ADOPTION OF THE AGENDA

2. The Sub-Committee adopted the provisional agenda prepared by the secretariat (ST/SG/AC.10/C.3/15 and Add.1), as modified for inclusion of papers submitted at a later date. Documents ST/SG/AC.10/C.3/R.379, -/R.385 and -/R.445 were withdrawn from the agenda.

ELECTION OF OFFICERS

3. The Committee of Experts at its seventeenth session had agreed that Mr. L. Grainger (United Kingdom) and Mr. J. Monteith (Canada) should be re-elected as Chairman and Vice-Chairman respectively for the biennium 1993-1994 (ST/SG/AC.10/19, paragraph 216).

ADMINISTRATIVE MATTERS

4. Several delegations underlined the fact that most of the documentation, including the annotated agenda, had been received only two weeks prior to the session and that many documents had not been received at all before the opening of the session. A member of the secretariat recalled that there was a ten week deadline for submitting documents and that the secretariat could not ensure reproduction and circulation in due time when documents were not received prior to the deadline.

5. The Sub-Committee was also informed of the installation within the Publishing Service of the United Nations Office at Geneva, of an optical disk databank to facilitate the storage, referencing, archiving, remote retrieval and electronic distribution of conference documents. In order to facilitate the implementation of the system, delegations are encouraged to submit their future proposals on diskette, in accordance with guidelines which were circulated during the session.

RATIONALISATION OF THE MANUAL OF TESTS AND CRITERIA

6. In accordance with the plan of work and time-table for rationalization of the Manual of Tests and Criteria adopted by the Committee (ST/SG/AC.10/19, annex 2), a Working Group on the Rationlization of the Manual of Tests and Criteria had been scheduled for consideration of Parts II and III of the Manual. It had been agreed at the seventh session of the Sub-Committee that background documents ST/SG/AC.10/R.343 (Secretariat), ST/SG/AC.10/C.3/R.370 (United Kingdom), -/C.3/R.366 (Germany), -/C.3/R.399 (Netherlands) and -/C.3/R.400 (Netherlands) should be discussed by the Working Group (see ST/SG/AC.10/C.3/14, paragraph 18).

Document ST/SG/AC.10/C.3/R.436 (United Kingdom)

7. The Sub-Committee considered that certain tests, as listed in paragraph 4 of this document, should remain both in the next revised Recommendations (Revision 9) and in the Manual of Tests and Criteria, in order to overcome the problem of lapse of time between the printing of the two publications. Once the Manual of Tests and Criteria has been published, it will be possible to consider possible deletion of redundant texts in the Recommendations.

8. The Sub-Committee agreed that certain sections should be reserved in Part III of the Manual so that test methods relating to Class 2, Class 6, Class 7 and Class 8 can be included in future, if necessary.

Document: ST/SG/AC.10/C.3/R.437 (United Kingdom)

9. This document relating to a simplification of the flow chart for the classification of organic peroxides and self-reactive substances was referred to the Working Group.

Document: ST/SG/AC.10/C.3/R.438 (United Kingdom)

10. It was agreed in principle that, as for explosives, a list of recommended tests for organic peroxides and self-reactive substances could be drawn up, on the understanding that alternative suitable tests would remain in the Manual. The document was referred to the Working Group.

Document: ST/SG/AC.10/C.3/R.441 (Germany)
(Listing and classificaion of substances presenting low explosion hazards outside Class 1)

11. As the document was circulated very late, its consideration was postponed to the next session.

Document: ST/SG/AC.10/C.3/R.442 Germany)
(Trough test for determination of the self-sustaining exothermic decomposition of fertilizers containing nitrates)

12. The document was referred to the Working Group.

Document: ST/SG/AC.10/C.3/R.465 (United States)

13. The Sub-Committee agreed to the deletion of test 1 (b) (iii), test 2 (b) (ii) and test 3 (b) (iii) from Part I of the Manual.

Working Group on the Rationalisation of the Manual of Tests and Criteria

14. The Working Group met under the chairmanship of Mr. O. Groothuizen (Netherlands) and discussions relating to its report are reproduced in paragraphs 25 to 34.

CLASS 1 (EXPLOSIVES) MATTERS

Documents: ST/SG/AC.10/C.3/R.186 and Add.1 (United Kingdom)
ST/SG/AC.10/C.3/R.333 (France)
ST/SG/AC.10/C.3/R.371, Corr.1 and Add.1 (United States)
ST/SG/AC.10/C.3/R.376 and Add.1 (United Kingdom)
ST/SG/AC.10/C.3/R.394 (United Kingdom)

15. The Chairman informed the Sub-Committee of the outcome of a working group session which was hosted by the Expert of the United States in Washington DC from 18 to 22 October 1993 to discuss the revision of explosives packing methods (see ST/SG/AC.10/C.3/14, paragraph 28). A preliminary report was circulated as information paper "INF.4" and "INF.4/Add.1". This report and its annexes supersedes all documents listed above, which are withdrawn.

16. All delegations were invited to send comments directly related to this draft report to Mr. Selby*/, of the United Kingdom delegation, at the latest by 31 January 1994, so that the report may be submitted in English and French in due time before the next session (deadline for submitting documents: 22 April 1994).

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*/ Mr. T. Selby, Head, Explosives Policy Section, Health and Safety Executive, Baynards House, Chepstow Place, London W2 4TF. Telephone: 071 243 6213; Fax:071 243 6034.

Document: ST/SG/AC.10/C.3/R.362 (Russian Federation)
(A new approach for testing explosive materials)

17. In the absence of the Class 1 expert from the Russian Federation, it was again agreed to postpone discussion of the proposed new approach to testing of explosives for hazard deflagration to explosion transition. (See also ST/SG/AC.10/C.3/14, paragraph 32). The Sub-Committee, noting that the document was drafted in general terms, considered that the expert from the Russian Federation should be invited to prepare concrete proposals for additional criteria if he wanted to pursue the idea of this new approach.

CRITERIA FOR DIVISION 5.1 (SOLID AND LIQUID OXIDIZING SUBSTANCES)

Document: ST/SG/AC.10/C.3/R.471 (France)
(Test and criteria for solid oxidizing substances)

18. The Sub-Committee noted that the document had been submitted rather late and could not be studied in detail prior to the session. The expert from France was requested to provide information on test results.

Liquid oxidizing substances

19. Similarly, late documents on tests and criteria for liquid oxidizing substances (Information paper INF.6 (Sweden)), and on tests and criteria for liquid and solid oxidizing substances (INF.9 Japan), had been made available only at the opening of the session.

20. The expert from the United States expressed the view that the proposed tests and criteria for liquid oxidizing substances were more related to the testing of the reactivity of the substances than to their oxidizing properties, i.e. their ability to cause, sustain or contribute to combustion.

21. The expert from Sweden recalled that there are still no criteria for liquid oxidizing substances and considered it urgent to fill the gap in the Recommendations and to introduce such tests in the rationalized Manual, on the basis of the work which has been done.

22. The expert from Japan introduced his information paper INF.9. He said that the test method for liquid oxidizing substances was restricted to Packing Group I substances since those were the substances provided by the industry, but he would consider other packing groups.

23. For solids, the expert from France recalled the problems associated with the use of sawdust for testing because it was obtained from different types of tree and thus produced variable results. In Europe, there is a tendency to use cellulose. The representative of CEFIC stressed the need also to define cellulose for tests, and he noted that there are specific standards for nitration grade cellulose in each country.

24. The Sub-Committee agreed that the Working Group on the Rationalization of the Manual of Tests and Criteria should have a preliminary look at the documents and a decision on future work could be taken later.

REPORT OF THE WORKING GROUP ON THE RATIONALIZATION OF THE MAUAL OF TESTS AND CRITERIA

25. The report of the Working Group on the rationalization on the Manual of Tests and Criteria is reproduced in Annex 1.

26. The expert from Canada expressed concern at the number of unresolved issues and questioned how much work still remained to be done. The Chairman of the Working Group said that the group worked in a spirit of great cooperation, and the unresolved issues would be addressed informally in the intersessional period.

27. The expert from Japan requested that his informal document INF.9 on tests for liquid/solid oxidizing substances be processed as an official document for the next session.

28. The expert from the United States shared the concern expressed by the expert from Canada on the number of unresolved issues, in particular for the test for solid oxidizing substances. He wondered whether there was such a need to substitute a new test for the existing one in Section 11.2.2 of the Recommendations. He also questioned the need to mention that sections 31, 35, 36 and 37 were reserved respectively for Classes 2, 6, 7 and 8, as there was no agreement on the inclusion of test methods for these classes. He suggested use of the word "Reserved" without any indication of class.

29. With regard to the need for test methods for solid oxidizing substances, the expert from France recalled that the present section 11.2.2 had been introduced provisionally on the understanding that it was not completely satisfactory.

30. The expert from the United Kingdom said that since parts of the test proposed by Japan for solid oxidizing substances were intended as improvements or clarifications to the existing test he would introduce them in square brackets in the consolidated document on Parts II and III to be submitted at the next session (document ST/SG/AC.10/C.3/R.475).

31. The Sub-Committee recognized that the test method for solid oxidizing substances annexed to the Working Group's report was only a redrafted version of that being proposed by France in document -C.3/R.471 and agreed that it should appear between square brackets.

32. All interested experts were invited to exchange test results in the intersessional period; if new results were available, the expert from France would prepare a new document with test methods for solid oxidizing substances.

33. The expert from Sweden would prepare a revised version of information paper INF.6 on test criteria and methods for liquid oxidizing substances.

34. The Sub-Committee agreed on the timetable proposed for the Working Group during the next session.

REVIEW OF CHAPTER 12 AND MULTIMODAL TANK TABLES

Documents: ST/SG/AC.10/C.3/R.253 (United States)
(Portable tank tables; comparison UN Recommendations and IMDG Code)
ST/SG/AC.10/C.3/R.422 (United States)
(Comparison of requirements for multimodal tanks intended to carry liquids)
ST/SG/AC.10/C.3/R.461 (United States)
(Terms of reference for the multimodal tank working group)

35. It was recalled that the Sub-Committee had agreed at its last session that the review of Chapter 12 and of the multimodal tank tables could be discussed by a working group which IMO had proposed to host from 17 to 21 January 1994 after the session of its Sub-Committee on the Carriage of Dangerous Goods on its 45th session (CDG 45) (see ST/SG/AC.10/C.3/14, paragraphs 81 to 92).

36. A member of the secretariat underlined that this working group should be considered as an informal group on the review of Chapter 12, hosted by IMO, and not as an official working group of the Sub-Committee, as the establishment of an official inter-sessional working group would require approval by the Economic and Social Council according to Rule 24 of the Rules of Procedure of the Council.

37. The Sub-Committee confirmed that the harmonization effort includes the following tasks:

- Harmonization of the tank construction and operating requirements;
- Development of a rationalized approach to assigning specific requirements to substances; and
- Harmonization of requirements for specific substances.

On the assumption that the consolidation of tank construction and operating requirements will not affect the rationale for assigning requirements to individual substances allowed to be transported in multimodal tanks, the Sub-Committee will develop a rationalized approach to assigning requirements to specific substances concurrently with the consolidation effort. Harmonization of requirements for specific substances will follow the development of a rationalized approach.

38. The Sub-Committee defined objectives for the review of Chapter 12 and the multimodal tank tables on the basis of document -/C.3/R.461. These objectives are reflected in annex 2 to this report, and should guide any working group which may be convened for that purpose.

39. The expert from Germany */ offered to act as a focal point for the collection of written comments which may be submitted on document ST/SG/AC.10/C.3/R.422 for discussion by the Working Group.

40. The expert from France drew attention to the work presently being carried out by the RID/ADR Joint meeting on Class 2, which would also address the question of tank-containers for gases; supported by the observer of Spain, he expressed the view that proposals should be developed in parallel to revise the part of Chapter 12 applying to multimodal tank-containers for gases, as he felt that there were more differences between the basis of Chapter 12 and that of RID/ADR for gases than for liquids and solids.

41. The representative of AEGPL said that the question of multimodal tank containers was not a subject of great concern to the liquefied petroleum gas industry and advice should be sought from organizations such as the European Industrial Gas Association (EIGA).

42. The Sub-Committee agreed that the work should start with multimodal tank-containers for liquids and solids, but there would be no objection to drawing up a basic document in parallel for gases.

43. Document ST/SG/AC.10/C.3/R.253 was carried forward to the next session.

Document:ST/SG/AC.10/C.3/R.466 (United States)
(Table 12.1 - Entry for Difluoromethane, UN 3252)

44. The proposal to amend the entry in Table 12.1 was adopted (see annex 3).

CLASS 2 (GASES) MATTERS (INCLUDING ISO WORK ON STANDARDS FOR GAS CYLINDERS AND QUALITY ASSURANCE)

Documents: ST/SG/AC.10/C.3/R.472 (ISO);
ST/SG/AC.10/C.3/R.473 (ISO)

45. The representative of ISO presented two documents containing a draft outline of basic rules for an international quality assurance system for transportable gas cylinders (-/C.3/R.472) and a progress report on the work carried out by the Technical Committees ISO/TC-58 (gas cylinders). He emphasized the fact that all TC 58 Sub-Committees had been made aware of the concerns expressed by this Sub-Committee (see ST/SG/AC.10/C.3/14, paragraph 130) and that every effort was being made to achieve results by the end of 1994.

46. The Sub-Committee noted in particular that for steel gas cylinders, an ISO/CEN common document had been developed for the parallel approach procedure, which had been approved by CEN but not by ISO/TC 58/SC3, and therefore further parallel work was needed.

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*/ Mr. B. Toerkel, Deputy Head, Carriage of Dangerous Goods Section, Federal Ministry of transport, Robert-Schuman-Platz 1, D-53175 BONN 7 (Tel: Switchboard: (0228) 300-0, Tel:(0228) 300 2431; Fax: (0228) 300 3428 or 3429.

47. The representative of ISO also mentioned the problem of the mark to be used for certified gas cylinders; and whether it should be a new ISO mark or the UN mark as for other packagings. The Chairman said that the UN mark had a specific meaning in the context of chapters 9 and 16 of the Recommendations and its extension to gas cylinders would require careful consideration.

48. The expert from the United States said that he was pleased to hear that progress had been made,but that he would not be in favour of referring to an ISO standard until the work on quality assurance systems was finalized.

49. The expert from France said that, the construction of tanks should be governed by transport regulations because tanks are intended for transport but, on the other hand, the regulations applicable to the safety of use should take precedence over transport regulations in the case of cylinders, as gas cylinders are intended primarily for use and the level of safety of these regulations is acceptable for the transport of gas cylinders.

50. Most delegations expressed support for references to standards, and the Sub-Committee encouraged ISO to finalize the work on standards on gas cylinders and on quality assurance systems before the end of 1994 so that references could be included in the next revised Recommendations and international transport regulations.

Document: ST/SG/AC.10/C.3/R.451 (Secretariat, on behalf of the RID/ADR Joint Meeting)

51. The representative of OCTI introduced the proposed amendments to Class 2 as prepared by the RID/ADR Joint Meeting in the context of the present revision of Class 2 of RID and ADR.

Indication of the physical state (COMPRESSED, LIQUEFIED, REFRIGERATED LIQUID) in the proper shipping name

52. Several delegations felt that the addition of the word "COMPRESSED" would not increase safety, and they did not support the deletion of the word "LIQUEFIED", as this indication is important for emergency response purposes.

53. The representative of OCTI said that there is at present no consistency in the Recommendations, as the qualifications "COMPRESSED", "LIQUEFIED" or "REFRIGERATED LIQUID" are used in the proper shipping names of certain compressed, liquefied or refrigerated liquid gases but not in others. He invited the Sub-Committee to consult document ST/SG/AC.10/C.3/R.460 where gases are grouped according to their physical state in accordance with the definitions of paragraph 1.15 of the Recommendations and which shows with evidence this lack of consistency, including for liquefied gases. He also questioned whether the word "COMPRESSED" had been used in the past to differentiate between gases which may be carried as compressed gases or as refrigerated liquids.

54. As the document had been circulated very late, it was agreed to refer the question (section 1 of the document) to the next session.

New generic entries for Class 2

55. The proposal to add new generic entries for various compressed gases, liquefied gases and refrigerated liquefied gases was adopted (see annex 3).

Introduction of P number for halogenated hydrocarbons

56. The Sub-Committee noted that a proposal had been submitted to the IMO DSC Sub-Committee to prohibit R numbers as alternative proper shipping names. It was agreed that R numbers should not be listed in Chapter 2 as alternative proper shipping names but references should be included in the alphabetical index (see annex 3).

Definition of oxidizing gases

57. According to the RID/ADR Joint Meeting, ISO standard 10 156:1990 defines oxidizing gases as gases which contribute to the combustion of other material as or more than air does and it was therefore proposed to align the definition in paragraph 1.17.1 and to require an oxidizing subsidiary risk for UN 1002.

58. Most delegations considered that air should not be considered as a dangerous oxidizing substance and therefore the addition of the subsidiary risk was not adopted. However it was agreed by a very narrow majority to align the definition.

59. The expert from the United Kingdom thought that a special provision should be added to the entry in Chapter 2 and in Chapter 3 to explain the inconsistency.

60. The representative of OCTI said that it was not the intention of the Joint Meeting to introduce inconsistencies, and that if this subsidiary risk was deemed unnecessary, the Joint meeting would reconsider the point.

61. After the discussion, a member of the secretariat checked ISO 10 156 and said that this standard does not contain definitions of oxidizing gases but contains methods for determining whether gases or mixtures of gases have a lower, equal or higher oxidizing potential than air. This method aims at facilitating the implementation of ISO 5145, on the selection and dimensioning of cylinder valve outlets for gases and gas mixtures. ISO 5145 defines several groups of gases and mixtures of gases, among which there are groups of "Highly oxidizing" gases (with an oxipotential greater than air), and groups of gases which support combustion (with an oxipotential equal to or less than air). Therefore, he said that the Sub-Committee might wish to check carefully both standards and if necessary to reconsider the decision taken.

Classification of hydrocarbon gases and mixtures

62. The representative of OCTI explained that for tank transport it was important to differentiate between pure gases (such as butane) and mixtures (such as butane mixtures) for which the test-pressure and filling degree values are different from those for pure gases and have to be determined. He confirmed that pure hydrocarbon gases are carried in significant quantities.

63. The Sub-Committee decided to defer the question to the next session. The Expert from the Netherlands offered to prepare a proposal on the definition of pure gases.

Addition of the synonym "(GAS CARTRIDGES)" for UN 2037

64. This proposal was adopted (see annex 3).

CLASS 8 (CORROSIVE SUBSTANCES) MATTERS (INCLUDING TEST METHODS FOR DETERMINING METAL CORROSION)

Document:ST/SG/AC.10/C.3/R.462 (United States)

65. The proposal to list standard ASTM G 31-72 (Reapproved 1990) as an acceptable test method for the purpose of assigning substances to Class 8, Packing Group III on the basis of the metal corrosivity criterion, (paragraph 8.4 (b) of the Recommendations) was adopted.

66. The Sub-Committee noted that an ISO standard was under preparation; and experts were invited to provide the secretariat with other test methods that might be deemed acceptable.

Review of classifcation for Class 8

67. The expert from Japan presented an information paper (INF.8) on the subject, where it was proposed to divide the criteria into those relating to the necrosis of tissues and those relating to corrosion to metals and to electrical conductors.

68. Most experts considered that the criteria for Packing Groups I and II should remain on the basis of necrosis and that criteria for metal corrosion should be envisaged at the level of Packing Group III only. Developing two parallel kinds of criteria would imply difficulties for determining the precedence of hazards.

69. On the basis of comments made, the expert from Japan said that he did not wish to pursue the matter with this document.

LISTING AND CLASSIFICATION

70. The expert from Italy, recalling the good cooperation between the secretariats of UNEP/IRPTC and UN/ECE, and the establishment of a data bank by IRPTC on chemical data profile, suggested that, in future, this data bank should be consulted systematically when classification or reclassification proposals are considered. The Sub-Committee agreed to that suggestion on the condition that accompanying data sheets would still be required, and invited the secretariat to examine its feasibility.

Documents: ST/SG/AC.10/C.3/R.420 (Germany)
(Division 6.1: grouping of pesticides)
ST/SG/AC.10/C.3/R.434 (HMAC)
(Division 6.1; classification of mixtures and deletion of Table 6.1)

71. Both documents address the possibility of introducing references to the WHO Recommended Classification of Pesticides by Hazard and Guidelines to Classification for the use of updated values of LD_{50} as given by WHO, in addition to using the calculation methods recommended by WHO for the Classification of formula. In addition, HMAC proposed deletion of Table 6.1 and the extension of the principle of calculation to all mixtures and not only to pesticides. The expert from Germany supported the proposal by HMAC.

72. The Sub-Committee considered that the consequences of the deletion of Table 6.1 and of the reference to the WHO Recommended Classification of Pesticides should be carefully examined, and the decision was postponed to the next session. The secretariat was invited to consult IPCS on the subject.

73. The Sub-Committee agreed to a provisional introduction of a new section 6.6, in square brackets, as proposed in paragraph 2 of Annex 1 to document -/C.3/R.434 (see annex 3). All delegations were invited to examine carefully the new texts for the next session and to submit proposals if deemed necessary.

Document: ST/SG/AC.10/C.3/R.428 (Canada)
(Methyl benzoate, UN 2938)

74. The proposal to delete UN 2938 was adopted because of insufficient evidence of oral toxicity (see annex 3).

Document: ST/SG/AC.19/C.3/R.429 (Canada)
(Dibromobenzene, UN 2711)

75. The Sub-committee agreed to delete the entry for UN 2711 because the flashpoints of all isomers are above 61°C. c.c.(see annex 3).

Document: ST/SG/AC.19/C.3/R.430 (Canada)

76. This document contained comments on a document prepared by the secretariat for the last session (ST/SG/AC.10/C.3/R.413) concerning the harmonization with the IMDG Code, RID and ADR. The amendments approved by the Sub-Committee are listed in annex 3.

77. For UN 1914, BUTYL PROPIONATE and UN 2348, BUTYL ACRYLATE, the representative of IMO was invited to check in IMO documentation the flashpoints of tert-BUTYL PROPIONATE and tert-BUTYL ACRYLATE to see whether only the normal -BUTYL isomer should be covered by the entry.

78. For UN 2410, 1,2,3,6-TETRAHYDROPYRIDINE, the Sub-Committee observed that the designating "1,2,3,6-" and "1,2,5,6-" apply to the same isomer, and the correct numbering should be "1,2,3,6-" which is the lower one.

79. With respect to the change of name of UN 1110 from AMYL METHYL KETONE to n-AMYL METHYL KETONE, it was agreed to postpone the decision to the next session. It should be checked whether other isomers meet the criteria of Class 3 and are carried in significant quantities. The Sub-Committee noted that ISOAMYL METHYL KETONE is covered by UN 2302 (5-METHYLHEXAN-2-ONE) and that 4-Heptanone is covered by UN 2710.

Document: ST/SG/AC.10/C.3/R.431 (Canada)
(Parameters to be considered with respect to the assignment of plural shipping names)

80. Certain parameters proposed were found unclear and no consensus could be achieved on this question. Some delegations felt that it was important to determine in each case whether isomers have the same physical and chemical properties and whether they are all carried in significant quantities. Other delegations preferred to have all isomers covered by a UN number listed by name rather than to have a plural generic name, to avoid confusion. The matter was referred to a drafting group, but the expert from Canada was finally invited to address the problem again by preparing a new note to Chapter 2 for the next session.

Document: ST/SG/AC.10/C.3/R.439 (Germany)
(Sodium/sulphide - sodium/nickel chloride batteries)

81. The Sub-Committee agreed that this proposal aiming at differentiating batteries containing solid sodium from those containing liquid sodium should be reconsidered at the next session. The expert from Germany was invited to provide more information on batteries containing liquid sodium, the quantities carried, the conditions of transport the interface with the existing entry, etc. and to exchange information with interested experts.

Document: ST/SG/AC.10/C.3/R.440 (Germany)
(Table of precedence of hazard)

82. The expert from Germany said that the proposed new table of precedence of hazard did not contain any substantial modification as it was based on the RID/ADR table which is now supposed to reflect the UN Recommendations. It contained however new entries for better differentiating mixtures of liquids and solids, as well as a new column for Class 9.

83. Noting that, by definition a substance can only be classified in Class 9 if it does not meet the definition of any other hazard class, the observer from HMAC observed that including a Class 9 column in the precedence of hazards table would appear to be in contradiction with the basic philosophy underlying the UN classification system.

84. The representative of OCTI explained that the footnote relating to UN Nos. 2315, 3151, 3152 (PCBs etc.) implied that solutions or mixtures containing such substances should remain in Class 9, even if they have the properties of other classes as, if they were carried under an N.O.S. entry of another class such as Class 3, the information relating to their danger to the environment would be lost.

85. The representative of OCTI also explained that the proposal in paragraph 1 of -/C.3/R.440 to replace in paragraph 1.44 the sentence "Substances of Division 6.1 with a packing group I inhalation toxicity" by "Substances of division 6.1 or Class 3 with a packing group I" inhalation toxicity was due to the fact that in the new Class 6.1 of RID/ADR there was no N.O.S. entry under the title A (Substances having a flashpoint below 23°C and toxic), but that there were such entries in Class 3 under the title B (Substances having a flashpoint below 23°C and toxic).

86. It was recalled that according to the present paragraph 1.44 of the UN Recommendations, flammable liquids with an inhalation toxicity of Packing Group I should be assigned to Division 6.1, Packing Group I with a subsidiary risk of Class 3, and entries such as UN 2929, TOXIC LIQUID, FLAMMABLE, ORGANIC, N.O.S. could have been included under items 1° to 10° of Class 6.1 of RID/ADR.

87. The Sub-Committee agreed to defer consideration of the document to the next session on the understanding that the proposal should be revised in the light of the comments made.

Document: ST/SG/AC.10/C.3/R.443 (Germany)
(Aluminium processing by-products)

88. The expert from Germany proposed to restrict UN 3170 to aluminium smelting residues on the grounds that spent aluminium potlining and spent cathodes do not meet the criteria of Class 4.3. It was however recalled that grave accidents had occured during the transport of aluminium potlinings; an information paper (INF.15) on an explosion on board a vessel carrying aluminium salty slag in bulk was also provided by the expert from the Netherlands.

89. It was mentioned that results obtained from tests performed in a laboratory were not always consistant and the conditions of tests were not always representative of the conditions of transport especially for such kinds of by-products carried in bulk. The Sub-Committee felt that experts concerned should exchange data and test results and should consolidate more information in consultation with the aluminium industry for the next session.

Document: ST/SG/AC.19/C.3/R.444 (Germany)
(UN 2295, Methyl chloroacetate)

90. Certain delegations expressed the wish that the data presented for assignment to Packing Group I instead of II should be checked and confirmed, and the document was deferred to the next session. The expert from Germany

was also invited to supplement the proposal with a revised entry in Chapter 12.

Document: ST/SG/AC.10/C.3/R.446 (United States) (UN 2801)

91. The proposal to allow assignment of Packing Group I in addition to Packing Groups II and III (special provision 185 instead of 184) for UN 2801, DYES, LIQUID, CORROSIVE, N.O.S. or DYE INTERMEDIATES, LIQUID, CORROSIVE, N.O.S. was adopted (see annex 3).

Document: ST/SG/AC.10/C.3/R.447 (Germany)
(UN 1695, chloroacetone, stabilized)

92. The data provided (flashpoint between 23°C and 61°C) showed that a Class 3 subsidiary risk should be added, and this was agreed (see annex 3).

Document: ST/SG/AC.10/C.3/R.448 (CEFIC)

93. The proposal to add a new entry for ORGANIC PIGMENTS, SELF-HEATING in Division 4.2 was adopted (see annex 3).

Document: ST/SG/AC.10/C.3/R.452 (United Kingdom)
(UN 1610, Halogenated irritating liquid, n.o.s.)

94. The proposal to delete the entry UN 1610 was adopted (see annex 3).

Document: ST/SG/AC.10/C.3/R.453 (United Kingdom)
(UN 1139, Coating solution)

95. The proposal aimed at deleting this entry, as coating solution could be assimilated to paints (UN 1263). The expert from the United States said that this designation was widely used in his country. It was therefore decided to keep the entry and to supplement the name with a descriptive text, and to replace special provision 184 by 185 as Packing Group I was also provided for in RID/ADR in comparison with the case of paints (see annex 3).

Document: ST/SG/AC.10/C.3/R.455 (United Kingdom)
(Plastics moulding compound)

96. It was agreed that the decision to add "PLASTIC MOULDING COMPOUND" under UN 2211, taken at the seventh session (see ST/SG/AC.10/C.3/14, paragraph 67 and Annex 2) should be reversed in favour of the new proposal to add a separate entry for "PLASTICS MOULDING COMPOUND in dough, sheet or extruded rope form, evolving flammable vapour" in Class 9, Packing Group III, with special provision 207 as amended at the seventh session. The reasoning was that plastics moulding compound and expandable polymeric beads have different properties and that transport in IBCs, in bulk in freight containers and in tanks may be unlikely for plastic moulding compound.

Document: ST/SG/AC.10/C.3/R.456 (United Kingdom)
(Metal alcoholates)

97. The proposal to add special provisions 182 and 183 respectively to UN 3206 and UN 3205 was adopted (see annex 3).

REVIEW OF CHAPTER 3

Document: ST/SG/AC.10/C.3/R.457 (United Kingdom)
(Special provisions 15, 18 and 114)

98. The proposal intended to clarify that the maximum quantities quoted under special provisions 15, 18 and 114 apply to the maximum quantity per package and was adopted (see annex 3).

Document: ST/SG/AC.10/C.3/R.458 (United Kingdom)
(Review of Chapter 3)

99. The proposal aimed at simplifying Chapter 3 by eliminating redundant special provisions i.e. substituting special provisions 184 and 185 for special provisions 102, 44 or 112. The document also contained a detailed comparison of the provisions of the IMDG Code, RID/ADR and ICAO Technical Instructions with respect to the allocation of packing groups. The principle of the proposal was agreed and the adopted changes are reflected in annex 3.

100. As a result, it appears that modifications would be needed in the modal instruments for better harmonization as follows:

RID/ADR:	UN 1989
IMDG Code:	UN 1133, UN 1224, UN 1263, UN 1863, UN 1866, UN 1987, UN 2059, UN 2623
ICAO-TI:	UN 1133, UN 1263, UN 1267, UN 1863, UN 1866, UN 1903, UN 2623

101. For UN 1133 (ADHESIVES), UN 1263 (PAINT), UN 1866 (RESIN SOLUTION), UN 1903 (DISINFECTANT, LIQUID, CORROSIVE, N.O.S.), UN 2059 (NITROCELLULOSE SOLUTION, FLAMMABLE), the decision was to keep open a possibility for Packing Group I as such products are carried.

102. For UN 1224 (KETONES, LIQUID, N.O.S.) and UN 1987 (ALCOHOLS, N.O.S.), the Sub-Committee noted that ketones or alcohols with a boiling point below 35°C do not exist and therefore Packing Group I is not applicable. On the contrary, acetaldehyde with a boiling point of 21°C is the only aldehyde with a boiling point below 35°C, and a mixture with propyl aldehyde may also have a boiling point below 35°C, therefore the possibility for Packing Group I should be retained.

103. Petroleum crude oil (UN 1267) may have a flashpoint above 23°C and therefore the possibility for Packing Group III was retained.

104. The expert from the United States provided detailed information on the characteristics of "fuel, aviation, turbine engine", which indicated that the three packing groups I, II and III were possible for UN 1863.

105. For UN 1611 (HEXAETHYL TETRAPHOSPHATE), the Sub-Committee decided to retain Packing Group II only. It was noted that ICAO provides for various possibilities depending on the physical state, which suggested that the ICAO Technical Instructions address pesticide formulations rather than the pure products. The expert from Canada said that if the product is used only as a pesticide, it should be carried under the appropriate organophosphorus pesticide entry and the entry UN 1611 could be deleted; he offered to make a proposal for the next session.

106. The United Kingdom document suggested that UN 2623, firelighters, solid with flammable liquid, should be assigned Packing Group III only, as the classification criteria of Class 4.1 do not seem appropriate for such articles, and as the flashpoint of the flammable liquid impregnating the solid is not a relevant criterion (see also polymeric beads impregnated with flammable liquid in Class 9). These articles are designed to ignite and burn quite fiercely, but steadily. The Sub-Committee agreed to assign Packing Group III only. The expert from Canada said that certain briquettes for barbecues could meet the criteria for Packing Group II and he offered to collect new information for the next session.

Document: ST/SG/AC.10/C.3/R.464 (United States)
(Special Provision 145, alcoholic beverages)

107. As invited at the seventh session (ST/SG/AC.10/C.3/14, paragraph 75), the expert from the United States had prepared a new text for special provision 145 to take account of previous discussions and proposed to consider several principles.

108. The Sub-committee agreed by a large majority (no vote against) that alcoholic beverages with 70 per cent or more should be transported under UN 3065, Packing Group II, and not under any other entry such as 1170 (ETHANOL SOLUTION).

109. The Sub-committee agreed by a large majority (one vote against) that alcoholic beverages with 70 per cent or more alcohol could be considered for exemption when packaged in inner packagings of up to 5 litres capacity.

110. The Sub-Committee agreed by a large majority (one vote against) that alcoholic beverages containing more than 24 per cent but not more than 70 per cent alcohol by volume could continue to be exempted when carried in receptacles of not more than 250 litres, as this is the current practice in the IMDG Code and RID/ADR and there is no experience of accidents. It was recalled that because of the high commercial value of such alcoholic beverages, the standards for packagings used were often higher than those of Chapter 9, and special precautions were taken during transport to prevent any loss or damage.

111. Once these principles were agreed upon, the question occurred whether, for the exemptions, the special provision 145 should reflect the different approaches by IMO and ICAO.

112. The expert from Italy said that the Recommendations are addressed to all modes of transport and they should not reflect the deviations, as this could encourage individual modes to deviate and would complicate the Recommendations.

113. The Sub-Committee considered that deviations from the Recommendations should not be encouraged as harmonization is essential for the facilitation of multimodal transport, but it recognized that in special cases such as exemptions or safety aspects particular to one mode or modal approach may be justified; as long as such deviations remain exceptions and are more stringent they may be listed in the Recommendations to reflect the position at modal level and to avoid confusion (see also paragraph 1.4.2 and special provisions 106 and 117).

114. The revised text of special provision 145 is reproduced in annex 3.

MATTERS RELATING TO PACKAGINGS AND INTERMEDIATE BULK CONTAINERS

Document: **ST/SG/AC.10/C.3/R.423** (United Kingdom)
(Use of the term "semi-rigid IBC" in Chapter 16)

115. The proposal to delete references to semi-rigid IBCs in 16.1.2.1 and 16.1.2.2.1 was adopted as no definitions have been developed for such IBCs within the types defined elsewhere in Chapter 16 (see annex 3).

Document: **ST/SG/AC.10/C.3/R.454** (United Kingdom)
(Supplementary packaging to move leaking drums)

116. The Sub-Committee encouraged the expert from the United Kingdom to pursue its work on supplementary packagings for emergency response, which are intended to collect and ensure the safe movement of a damaged packaging to a point of disposal, as it was recognized that such movement could occur on long distances and that emergency services required a suitable level of safety for such supplementary or "salvage" packagings. The expert from the United Kingdom invited suggestions to be sent to him in correspondence.

Document: **ST/SG/AC.10/C.3/R.459** (SEFEL)

117. A large majority of experts supported the proposal of SEFEL to align the text of paragraph 9.3.11 with paragraph 10.13 of the IMDG Code, i.e. to require that empty packagings should be treated as filled packagings "unless adequate measures have been taken to nullify and hazard" rather than "unless it has been purged from its residues", as there are cases where the residue is not dangerous (such as paints or adhesives which have dried up). The proposal was adopted, and a similar amendment was agreed for IBCs (paragraph 16.1.6.6).

Document: ST/SG/AC.10/C.3/R.468 (United Kingdom)
(Chemical compatibility of plastics packagings)

118. The proposal intending to restrict the scope of paragraphs 9.7.2.5, 16.4.8.1 and 16.5.8.1 to plastics materials used in the manufacture of packagings or IBCs intended to contain liquids, was adopted.

119. The expert from Italy expressed concern at the fact that this decision implied that the chemical compatibility with solids would not have to be checked and the interpretation might be that paragraphs 9.3.2, 9.6.7.1 and 9.6.7.4 would be applicable to packagings intended to contain liquids only.

120. The expert from Germany favoured the principle of the proposal but recalled that certain solids may melt during transport, especially those with a melting point between 20°C and 45°C, and he considered that packagings intended to carry such substances should also be covered. The expert from Canada shared these views, as certain solids melting during transport may have highly corrosive properties. The representative of HMAC said that such substances would melt only for a short period and would resolidify and the packagings would not be altered.

Cold drop test

121. The expert from the United Kingdom presented a draft proposal (Information paper INF.3) which questioned whether the cold drop test required under 9.7.3.2 was really needed for combination packagings with inner plastic bags intended to carry solids or articles. On the basis of comments made, the expert from the United Kingdom said that he would prepare an official proposal for the next session.

SEGREGATION REQUIREMENTS FOR DANGEROUS GOODS

Document: ST/SG/AC.10/C.3/R.425 (China)

122. In addition to the proposal from China, an information paper (INF.5) was submitted by the observer of the Islamic Republic of Iran. Several delegations expressed the view that the proposal by China, based on the segregation requirements of the IMDG Code, was too specifically related to one mode of transport and could not be applied to all modes. It was recognized that there would be merit in having harmonized requirements for the purpose of multimodal transport in freight containers, but there were so many more stringent exceptions to the general segregation table of the IMDG Code that these could not be reflected in the Recommendations. Other than for multimodal transport, there is no need for harmonized requirements as the segregation requirements have to be developed for the specific mode of transport.

123. The Sub-committee agreed that the proposed recommendations on segregation should be drafted in general terms to reflect basic principles that can be used for developing detailed requirements specific to each mode. The expert from China said that he would submit a new proposal along these lines.

Document: ST/SG/AC1.0/C.3/R.470 (Argentina)
(Coding system for the segregation of dangerous goods)

124. As the proposal had been submitted very late, the observer from Argentina said that discussion of this document could be postponed until the next session.

REVIEW OF CHAPTER 15 (DANGEROUS GOODS IN LIMITED QUANTITIES)

125. No document had been submitted under this agenda item. The expert from Germany said that he would submit a comprehensive document for the next session.

126. The expert from the United States said that the question of marking cargo transport units loaded with dangerous goods in limited quantities (see also document ST/SG/AC.10/19, paragraphs 35 to 37) would be readressed by the IMO Sub-committee on the Carriage of Dangerous Goods (CDG) (10-14 January 1993) on the basis of new proposals (CDG 45/3/1/1 and CDG 45/3/1/5). He invited all participants to ensure consultation at national level so that action taken by the CDG Sub-committee is compatible with the Recommendations.

SYSTEMATIC LIST OF ENTRIES (EXTENSION OF APPENDIX A)

Documents: ST/SG/AC.10/C.3/R.460 (Netherlands)
(Systematized list for Class 2)
ST/SG/AC.10/C.3/R.390 (United Kingdom)
(Extension of Appendix A and proposed sub-divisions)

127. Document -/C.3/R.460 contained a first compilation for Class 2 in a systematic order. The expert from the Netherlands also provided a draft list for Class 3 (Information paper INF.10) and he said that all classes would be finalized for the next session.

128. In document -/C.3/R.390, the expert from the United Kingdom had grouped all substances of Class 8 in three divisions (acidic substances, basic substances and other substances). His conclusion was that grouping chemicals together by properties may have considerable value in reviewing classification inconsistencies but would not be of general interest for users and could be confined to a reference document.

129. Several delegations questioned the need for such a list in the Recommendations, as they felt it would increase the volume of the publication but that it would not be of interest to users. Furthermore, the examples provided were supposed to group substances with similar properties and transport conditions and requiring similar emergency response. The example for Class 3 showed that many substances were listed under general headings such as "other flammable substances, mixtures and preparations containing flammable liquids" whereas many substances with different properties and requiring various emergency response measures had been grouped together.

130. Several experts said that they had consulted users and their industries, who had welcomed the preparation of such a list. The representative of CEFIC said it would be particularly useful for small chemical companies, who cannot afford, as can large companies, to have teams of specialists in the transport of dangerous goods.

131. It was recalled that the Committee had decided that such a list should be prepared during the biennium for inclusion in the ninth revision of the Recommendations (ST/SG/AC.10/19, paragraph 193), and therefore only the Committee would be entitled at its next session to decide whether the list prepared is suitable for inclusion in the Recommendations or not. In the meantime, the Sub-Committee should continue working on this list, and all delegations interested were invited to exchnage information and cooperate with the expert from the Netherlands so that all suggestions or criticisms may be taken into account.

132. As several delegations pointed out the usefulness of such a list for the purpose of classification, and as others believed that the list could be misleading in the process of classification, the expert from the Netherlands agreed to prepare an introductory section explaining the purpose and how to use such a list.

133. The expert from the United States expressed a reservation on any suggested use of the list for the purpose of emergency action.

ACTIVITIES OF THE IPCS COORDINATING GROUP ON THE HARMONIZATION OF CLASSIFICATION AND LABELLING SYSTEMS

Documents: ST/SG/AC.10/R.412 (Secretariat)
(UNCED, Agenda 21, Chapter 38)
ST/SG/AC.10/R.413 (Secretariat)
(UNCED, Agenda 21, Chapter 19)
ST/SG/AC.10/R.414 (Secretariat)
(UNCED, Agenda 21, Chapter 20)
ST/SG/AC.10/R.415 (Secretariat)
(UNCED, Agenda 21, Chapter 22)
ST/SG/AC.10/C.3/R.396 (Secretariat)
(Resolutions adopted by the General Assembly)
ST/SG/AC.10/C.3/R.397 (Secretariat)
(Decisions adopted by ECOSOC)

134. The Chairman recalled previous debates on the subject (ST/SG/AC.10/C.3/14, paragraphs 102 to 115), in the context of the follow-up to the 1992 United Nations Conference on Environment and Development (UNCED) (Chapter 19 of Agenda 21; General Assembly resolutions 47/190 and 47/191; ECOSOC Decision 1993/207).

135. The Sub-Committee noted that the consolidated analytical report of the Secretary-General which will focus on common UN system strategies for the implementation of Agenda 21 and which will indentify areas for further action for consideration by the Commission on Sustainable Development (CSD) will be

prepared, as far as Chapter 19 of Agenda 21 is concerned, by UNEP (as "Task Manager") through the Intersecretariat Coordinating Committee (ICC) of the International Programme on Chemical Safety (IPCS). The input would then be submitted to CSD through the Department for Policy Coordination and Sustainable Development (DPCSD). The report should include inputs from the secretariat on the activities of the Committee and the Sub-Committee of Experts on the Transport of Dangerous Goods.

136. The Sub-Committee also noted that an "International Conference on Chemical Safety" was scheduled in Stockholm from 25 to 29 April 1994, and that this Conference would consider the possible estabishment, on an Intergovernmental Forum on Chemical Safety, for the implementation of the various programme areas of Chapter 19 of Agenda 21.

137. The representative of ILO presented the results of the 4th meeting of the IPCS Coordinating Group for the Harmonization of Chemical Classification Systems (2-3 November 1993) (Information paper INF.14). He said that the ILO International Occupational Safety and Health Information Centre (CIS) would act as focal point for hazard communication (labelling, safety phrases, safety data sheets). The report suggested that:

(a) Ongoing work on classification criteria should be finalized by 1997 and the work to harmonize hazard communication, including labelling and safety data sheets should be completed by the year 2000;

(b) A mechanism to examine and resolve technical issues for which a solution could not be identified by consensus should be developed;

(c) An international instrument or recommendation on classification and labelling applicable legally at the national level should be developed.

138. The representative of ILO also said that one of the first conclusions of a draft report on "Classification systems for physical hazards and possibilities for greater harmonization" (see ST/SG/AC.10/C.3/R.364) was that, since the Committee had undertaken the revision and rationalization of the Manual on Tests and Criteria, all efforts should be made to support and strenghthen that activity and ensure that coordination with the more global harmonization activities was effective. As a consequence, ILO proposed that proposals for globally harmonized criteria for the classification of explosive, flammable and reactive substances (Classes 1, 3, 4 and 5) should be based on the UN Recommendations and developed by the Committee of Experts; this approach had been approved by the IPCS Intersecretariat Coordination Committee, and IPCS would be prepared to send a letter officially to the Executive Secretary of the UN/ECE for the attention of the Economic and Social Council requesting an extension of the mandate of the Committee, if necessary, so that aspects other than transport may be considered.

139. After long discussions on this matter, and on the problem of discussing intersectoral issues in a forum including mainly transport experts but also the need for avoiding contradictory work in another forum, the Sub-Committee, recalling that transport experts were supported by national experts on

physical hazards, agreed to indicate its willingness to play an active role by leading the work on physical hazards, on the following conditions:

(a) The work should be organized in a manner similar to that of the OECD Clearing House, i.e. all parties involved would be invited to participate, and decisions would have to be made on a consensus basis;

(b) Discussions would take place at the Sub-Committee level and not at working group level;

(c) The work should start only after finalization of the rationalization of the Manual on Tests and Criteria (i.e., at the earliest at the July 1995 Sub-Committee session);

(d) The scope of work would be limited to Classes 1, 3, 4 and 5.

140. The secretariat was invited to explore whether ECOSOC approval was necessary and if so, to ensure that such approval may be sought by the quickest possible means.

141. It was suggested that it would be beneficial to have the Class 8 criteria discussed by an OECD Clearing House as for the toxicity criteria; the specific criteria for corrosion rate on steel and aluminium used in the Recommendations should then also be taken into account.

142. With regard to the conclusions of the IPCS Coordinating Group, it was recalled that good arguments were put forward by modal organizations such as IMO for slowing down the rhythm of amendments to the Recommendations to avoid too frequent changes to the modal regulations and to ensure better implementation. The proposed date of 1997 for finalization of the ongoing work on classification criteria might be too ambitious; and it should be borne in mind that effective harmonization of the classification of existing substances on the basis of those criteria would take much more time.

143. The general view was that solutions to the harmonization of classification criteria should be reached by consensus. It was unclear how useful a formal mechanism would be to resolve non-consensus technical issues; an international instrument which would contradict the conventions or agreements applicable to the international transport of dangerous goods could not become legally applicable, unless those conventions or agreements were amended to take this instrument into account, but this would need support from transport bodies, i.e. prior consensus.

Classification criteria for toxicity

Documents: **ST/SG/AC.10/R.411** (Secretariat)
(Report of the 2nd OECD Clearing House)
ST/SG/AC.10/C.3/R.363 (United States)
(Report of the 2nd OECD Clearing House (comments))
ST/SG/AC.10/C.3/R.391 (United Kingdom)
(Acute toxicity criteria)
ST/SG/AC.10/C.3/R.449 (CEFIC)
(Harmonization of classirciation systems for dangerous goods - Class 6.1)
ST/SG/AC.10/C.3/R.450 (CEFIC)
(Class 6.1 - Modification of the cut-off limit of oral toxicity LD_{50} for liquids - 200 mg/kg instead of 500 mg/kg)
ST/SG/AC.10/C.3/R.467 (United States)
(Harmonization of criteria for division 6.1 substances)

144. In addition to document -/C.3/R.450, CEFIC presented an information paper (INF.12) on the consequences of a modification of the cut-off limit of oral toxicity LD_{50} for liquids from 500 mg/kg to 200 mg/kg. The Sub-Committee noted that the study made by CEFIC took into account of the other toxic properties of the substances (inhalation toxicity and dermal contact toxicity), as well as liquid mixtures/solutions.

145. Several delegations said that intersectoral groups had been established at national level to consider the question of harmonization of toxicity crteria and that they would have to wait for the conclusions of those groups before expressing a position. It was agreed that enough information had been received and that the Sub-Committee should take a decision at its next session, bearing in mind that such a decision would still have to be endorsed by the Committee in December 1994. Any delegation wishing to submit new arguments should do so before the deadline (22 April 1994).

146. The Sub-Committee expressed its appreciation and thanked the expert of the United States for document -/C.3/R.467 where the issues at stake were clearly laid down and would serve as a good basis for the final decisions.

147. The expert from Germany recalled that he had offered to prepare a new document concerning the relevant particle size for inhalation toxicity testing (see ST/SG/AC.10/C.3/14, paragraph 122).

148. The representative of CEFIC said that the European industry would prefer to continue to use volumetric units (ml/m^3 or ppm) rather than mg/l units for expressing toxicity by inhalation, because concentrations, flammability limits and occupational safety exposure limits are usually expressed in ppm. Therefore he hoped that his organization could convince the

Directorate General XI (DG XI) of the Commission of the European Communities to use the same units as for transport.

149. All experts were invited to thoroughly discuss the issues at the national level and to prepare themselves for a firm position at the next session. All documents were carried forward to the next session.

ENVIRONMENTALLY HAZARDOUS SUBSTANCES

Documents: ST/SG/AC.10/C.3/R.222 (IMO)
(Carriage of environmentally hazardous substances by sea)
ST/SG/AC.10/C.3/R.388 (United States)
(Comparison between IMO/US/OECD-RID/ADR criteria)

150. Documents -/C.3/R.222 and -/C.3/R.388 were background documents from the last session (see ST/SG/AC.10/C.3/14, paragraphs 49 to 56). The representative of CEFIC presented an information paper (INF.13) from which it could be seen that there are many differences in the various legislations that will lead to disharmony, but that there are also many similarities. He informed the Sub-Committee of a CEFIC/EC workshop which is scheduled to take place in early 1994 and which would discuss certain of these aspects. He drew attention to the considerable economic and administrative difficulties for industry in trying to comply with the various systems. He proposed the following points as a basis for further discussion and development of a harmonized set of criteria:

(a) Where the LC_{50} is < 1 mg/l, there are some grounds for harmonization;

(b) The appropriateness of "Z" and "T" as criteria to define a marine pollutant under MARPOL annex III might be reconsidered;

(c) Criteria for "+" i.e. a bioaccumulator associated with a product's *potential to cause harm* could be developed and adopted by IMO, RID/ADR, and EC;

(d) Physical properties, such as those being proposed by CEFIC could be used as an interpretation of "Readily Degradable" in the aquatic environment.

151. The expert from the United States said that the need for harmonizing criteria relating to hazards to the environment was recognized but that the Sub-Committee of Experts on the Transport of Dangerous Goods might not be the appropriate body to address the question. The Committee should cooperate with IMO and OECD and the IMO criteria should be considered more properly. The Sub-Committee could develop a list of points that should be raised.

152. The expert from Canada suggested that the appropriate body for harmonizing the criteria should be UNEP.

153. The Sub-Committee noted that OECD had proposed a set of criteria on the hazards to the environment and that transport organizations had now to evaluate these criteria and respond if necessary. Therefore discussion should continue at the level of the Sub-Committee, which should encourage harmonized

criteria in the transport sector. In this context the initiative of CEFIC was welcomed and further discussion with IMO was deemed essential.

RELATIONS WITH OTHER ORGANIZATIONS

Relations with UNEP

154. A representative of the Secretariat of the Basel Convention on the Transboundary Movements of Hazardous Wastes and their Disposal expressed her appreciation of the cooperation with the Secretariat of the Sub-Committee and wished to bring to the attention of the delegates that the notification and movement document prepared by the Secretariat of the Basel Convention and used by a number of Parties contained the UN-class and UN-number. In this respect, the Secretariat of the Basel Convention would appreciate the cooperation from the Sub-Committee in providing comments on these forms so as to improve their formats and facilitate the implementation of the Basel Convention. Copies can be obtained from the secretariat and comments can be sent to the Secretariat of the Basel Convention*/.

155. She said that the Secretariat of the Basel Convention was working towards the harmonization of classification of criteria for hazardous wastes to ensure their environmentally sound management, as recommended by Chapter 20 of Agenda 21. As instructed by the first meeting of the Conference of the Parties, the Secretariat of the Basel Convention is consulting the Secretariat of the Sub-Committee in the development of criteria for the definition of hazardous characteristics. In this process, the Secretariat of the Basel Convention is also cooperating with a number of international organizations, namely IMO, IPCS, UNIDO and OECD.

156. She expressed the wish to continue and strengthen cooperation with the Secretariat of the Sub-Committee to make sure that the substantial work done by the Sub-Committee provided a base upon which to develop criteria for the definition of hazardous wastes.

157. The Chairman recalled that the criteria of Annex III of the Basel Convention derived from the UN Recommendations and that as long as the criteria of the various categories H were kept in line with the Recommendations there should be no problem of harmonization. The Chairman assured the representative of the Secretariat of the Basel Convention that the Committee and its secretariat would continue to cooperate to ensure the harmonization of documentation and administrative procedures to the fullest extent possible. The expert from Germany said that the categories H1 to H13 correspond to Classes 1 to 9 as defined in the Recommendations as well as to the Manual of Tests and Criteria. He further said the Commission of the European Communities had difficulties in referring to criteria which have a

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recommendatory status, so he recalled that these criteria are made mandatory for air, sea and inland transport through the IMDG Code, the ICAO Technical Instructions, RID and ADR.

Relations with ISO

Document: **ST/SG/AC.10/C.3/R.426** (Canada)
(Technical Committee ISO/TC-207)

158. The Sub-Committee noted the information provided by Canada on this ISO Technical Committee on Environmental Management and invited experts and observers whose countries may be involved in the ISO work on the subject to keep the Sub-Committee informed on new developments.

DIVISION 6.2 (INFECTIOUS SUBSTANCES)

Document: **ST/SG/AC.10/C.3/R.424** (United Kingdom)
(Packagings provisions for infectious substances)

159. The proposal aimed at moving all the criteria concerning packaging, consignment procedures and IBCs for Division 6.2 to Chapters 9, 13 and 16 as appropriate. As there was no consensus on the subject, the expert from the United Kingdom agreed to reconsider the matter on the basis of comments made.

Documents: **ST/SG/AC.10/C.3/R.427** (Canada)
ST/SG/AC.10/C.3/R.435 (United Kingdom)
(Packagings code for Division 6.2)

160. The two documents were submitted following the discussions at the seventh session on whether or not packaging codes in accordance with Chapter 9 should be used for Division 6.2 - packagings (see ST/SG/AC.10/C.3/14, paragraph 142 and ST/SG/AC.10/C.3/R.411). The Sub-Committee agreed with the proposal by the expert from the United Kingdom that such codes should be used. (See annex 3.)

Document **ST/SG/AC.10/C.3/R.432** (EMAC)
(Amendments to the provisions for infectious substances, diagnostic specimens and biological products)

161. This document was presented as a follow-up to the discussions which took place at the seventh session (see ST/SG/AC.10/C.3/14, paragraph 141).

162. The expert from Germany recalled that the new provisions for Class 6.2 had been adopted at the last Committee's session and considered that it was too early to readdress the question, especially as these provisions would be implemented through the IMDG Code, RID, ADR and the ICAO Technical Instructions as from 1 January 1995. Therefore he opposed a review of the definitions.

163. The proposal in paragraph 10(a) of the document to revise the last sentence of 6.9(a) was adopted, in order to align this sentence with the WHO definition of risk group I. The expert from Germany expressed a reservation on the decision. He felt that this decision extends the scope of Division 6.2 too far without any safety reason.

164. The Sub-Committee noted that the definitions of Risk Group IV, III and II in the WHO Laboratory Biosafety Manual included the word "pathogens" rather than "micro-organisms", but it was agreed that the alignment of the WHO Manual should be discussed as a whole as consequential changes would have to be discussed throughout the text of Chapter 6 (refer to paragraph 10(b) of the proposal).

165. In the light of the discussions, the representative of HMAC withdrew the proposal in paragraph 10(c) to modify the definition for "Genetically modified organisms".

166. The Sub-Committee noted the views of HMAC that the definition of biological products should also cover products that are manufactured for use in diagnosis or substances of fermentation processes to the extent they contain, or may contain, infectious substances. The proposal was not adopted.

167. The proposals to revise paragraphs 6.10.1 and 6.10.2 were not adopted. With regard to performance tests, attention was drawn to possible different specifications depending on the mode of transport and to the development of a draft standard EN 829 by the European Committee on Standardization (CEN).

Document: ST/SG/AC.10/C.3/R.433 (HMAC)
(Miscellaneous amendments to the provisions forofr Division 6.2 (infectious) substances)

168. The proposals in paragraphs 2, 3, 6 and 7 were adopted, except that it was decided not to introduce a new paragraph 6.13.5(f) until further clarification has been obtained on the need for marking the letter U, and that for paragraph 6.14.7 references to liquid contents have been deleted as the reference to sufficient absorbent material and to the ability of the packaging to retain liquids was deemed sufficient.

169. The expert from Germany informed the Sub-Committee of discussions on the development of a type of so-called "hybrid" packagings which would contain toxic or corrosive substances intended to destroy the infectious substances in case of damage to the primary receptacle.

OTHER BUSINESS

Document: ST/SG/AC.10/C.3/R.463 (France)
(Sequential order of items of information in the transport document)

170. The Sub-Committee noted that, when introducing the UN numbers as substance identification numbers in RID and ADR, the RID/ADR Joint Meeting had

introduced a requirement that the sequence of the items of information in the transport document would be the UN number first, then the proper shipping name, and then the class number, contrary to the provision of paragraph 13.6.2 of the Recommendations and the existing practice for other modes of transport (IMDG Code, ICAO Technical Instructions), where the order is: proper shipping name, class, UN number.

171. The divergence had been drawn to the attention of the Joint Meeting by the secretariat (document TRANS/WP.15/AC.1/R.694) as this was considered to be a source of confusion and a practical obstacle in filling in transport documents for multimodal transport.

172. The Joint Meeting had recognized the need for as much uniformity as possible in dangerous goods transport documentation but felt that the Sub-Committee and the other bodies responsible for other transport modes should be requested to consider whether the order recommended in paragraph 13.6.2 should be revised to start with the UN number, on the grounds that the UN number is now used for all modes of transport and is the sole means of identifying a dangerous substance that is understood nearly everywhere in the transport, by all parties involved: transport industry, chemical industry, emergency services administrations etc.. This was the subject of the proposal by France in document ST/SG/AC.10/C.3/R.463.

173. The expert from Germany stated that a uniform harmonized system of consignment procedures for all modes of transport should be of great importance for safety reasons.

174. It was noted that such a change might imply financial cost to the industry, which had already established computerized systems for entering the information in transport documents. Certain delegations felt that the cost should not be overestimated as the change would only require a change in the computer programmes which would be very easy to make.

175. It was agreed that the question should be referred to IMO and ICAO for comment, and the representatives from IATA and ICS were invited to investigate the matter.

Document: ST/SG/AC.10/C.37R.469 (Canada)

176. The Sub-committee took note of the information provided on a pilot study for the transportation of special military materials. A meeting on the subject is expected to take place on 8 and 9 February 1994 and comments may be sent to the expert from Canada for the attention of Dr. J.A. Read.

FUTURE WORK PROGRAMME

177. The Sub-Committee suggested the following programme for the ninth session (4-15 July 1994):

(1) Class 1 matters: Revision of Chapter 10 (Special Recommendations on packing for explosives);

(2) Rationalization of the Manual of Tests and Criteria (Parts II and III) (see also Annex 2 of document ST/SG/AC.10/19);

(3) Criteria for Division 5.1 (criteria for classification of solid and liquid oxidizing substances);

(4) Review of Chapter 12 and the multimodal tank tables;

(5) Class 2 matters (including ISO work on standards for gas cylinders and quality assurance);

(6) Class 8 matters, including test methods for determining metal corrosion;

(7) Listing and classification;

(8) Editorial review of Chapter 3;

(9) Systematic list of entries (Extension of Appendix A);

(10) Matters related to packagings and intermediate bulk containers;

(11) Review of Chapter 15 (Dangerous goods in limited quantities);

(12) Segregation requirements for dangerous goods;

(13) Activities of the IPCS Coordinating Group on the Harmonization of classification and labelling systems;

(14) Environmentally hazardous substances;

(15) Division 6.2 (Infectious substances);

(16) Relations with other organizations.

The deadline for submission of proposals is 22 April 1994.

178. The Sub- Committee agreed that in principle no new proposals should be submitted directly to the Committee session (28 November - 7 December 1994) without the subject having first been discussed by the Sub-Committee. Therefore all delegations were invited to make sure that all relevant proposals are prepared in due time. New issues raised after the ninth session of the Sub-Committee should be deferred to the next biennium.

179. The following documents were carried forward to the next session:

ST/SG/AC.10/R.411, -/R.412, -/R.413, -/R.414, -/R.415,
ST/SG/AC.10/C.3/R.222, -/C.3/R.253, -/C.3/R.362, -/C.3/R.363,
-/C.3/R.367, -/C.3/R.369, -/C.3/R.382, -/C.3/R.387, -/C.3/R.388,
-/C.3/R.391, -/C.3/R.396, -/C.3/R.397, -/C.3/R.422, -/C.3/R.430,
-/C.3/R.434, -/C.3/R.439, -/C.3/R.440, -/C.3/R.441, -/C.3/R.443,
-/C.3/R.444, -/C.3/R.449, -/C.3/R.450, -/C.3/R.451, -/C.3/R.460,
-/C.3/R.463, -/C.3/R.467, -/C.3/R.470.

ADOPTION OF THE REPORT

180. The Sub-Committee adopted the report on its eighth session together with the annexes.

Annex 1

REPORT OF THE WORKING GROUP ON RATIONALISATION OF THE MANUAL OF TESTS AND CRITERIA

Introduction

1. A Working Group was established to consider further development of the draft rationalized Manual of Tests and Criteria proposed by the United Kingdom in document ST/SG/AC.10/C.3/R.370, which was prepared on the basis of discussions at an inter-sessional Working Group held at BAM in March 1993 (see document ST/SG/AC.10/C.3/R.366). The General Introduction and Part I of document -/R.370 were reviewed at the seventh session of the Sub-Committee (see document ST/SG/AC.10/C.3/14 paragraphs 5 to 19 and annex 1). The terms of reference of the Group were limited by the Sub-Committee to an editorial review and rationalization of the General Introduction (those sections relating to Parts II and III), Part II, Part III and appendices to the manual. Technical amendments which had been proposed in documents would also be considered. The Working Group was chaired by Mr. Groothuizen and included experts from: France, Japan, Netherlands, Norway, Spain, Sweden, Switzerland, United Kingdom, United States and from the European Chemical Industry Council (CEFIC).

2. The following documents were considered by the Working Group:

-/C.3/R.366	Report of the BAM Working Group (G);
-/C.3/R.370	Draft rationalized test manual (UK);
-/C.3/R.399	UN gap test (NL);
-/C.3/R.400	UN pressure vessel test (NL);
-/C.3/R.437	Amendments to the S/R and O/P flow chart (UK);
-/C.3/R.438	Recommended tests for Part II (UK);
-/C.3/R.442	Trough test (G);
-/C.3/R.471	Solid oxidizer test (F);
INF.7	UN Pressure vessel test (J); and
INF.9	Solid (and liquid) oxidizer tests (J).

Procedure

3. The Secretariat had suggested that two new documents further developing the rationalized manual (-/R.370) should be produced for the July 1994 meeting of the Sub-Committee, one containing the Contents, General Introduction and Part I (to be -/R.474) and the other Parts II and III, and the appendices (to be -/R.475). It was therefore agreed that the Working Group should produce a narrative report without the detailed text amendments to -/R.370. The UK will submit the formal documents to the Secretariat giving the maximum time for translation. All changes proposed relate to United Kingdom document -/R.370, unless otherwise stated.

4. Most of the text in square brackets was agreed as was the text proposed for deletion. Minor changes are not discussed in this report. The changes will be set out in the two formal UK documents referred to above. This report concentrates on the contentious issues, on the inclusion of new "UN" test methods and on areas where it was considered that additional, clarifying text was necessary.

5. The United Kingdom will prepare a document (-/R.476), proposing consequential amendments to the Recommendations for consideration at the ninth session of the Sub-committee. This document will take into account the Sub-Committee's decisions in regard to United Kingdom document -/R.436 (Consequential amendments to the Recommendations).

6. It was agreed that, where appropriate, any changes made to test prescriptions in Part II of the manual should also be made to the corresponding test prescriptions in Series 1 and 2 of Part I of the manual.

General Introduction

7. There was agreement that new paragraphs covering the classification of mixtures of:

- self-reactive substances and organic peroxides;
- organic peroxides and monomers; and
- self-reactive substances with other self-reactive substances,

should be prepared. The expert from the United Kingdom agreed to draft text and will include it in document -/R.474.

8. It was agreed that there should be a new paragraph in the section on safety to indicate that special care should be taken when disposing of samples which may have been destabilised during testing.

9. The tests recommended by the expert from the United Kingdom for Part II of the manual (document -/R.438) were provisionally accepted with the following qualifications:

- the UN gap test is accepted at the ninth session of the Sub-Committee;
- consideration is given to the requirement to perform two tests in Series C and E;
- the modified Trauzl test can properly be applied to self-reactive substances; and
- the Heat Accumulation Storage test is also recommended for packaged substances but not for substances transported in IBCs or tanks.

Introduction to Part II

10. The revised flow chart proposed in United Kingdom document -/R.437 was discussed and it was agreed that it should be inserted in the manual and the Recommendations, and the Recommendations, and consequential amendments to the box number references made. Figures 20.1 and 20.3 in document -/R.370 will be replaced.

11. It was decided to delete the text at the end of paragraph 20.3.3.3 relating to standards as one was still a draft, another a vague reference to national regulations and the third not directly applicable.

Test Series A

12. It was agreed that the screening procedure, and the requirement for performing cavitated detonability tests, should remain in square brackets pending decisions on the applicability of the Modified Trauzl test, the agreement of a UN Pressure Vessel test and the necessity for a cavitated detonability test.

13. Paragraph 21.3.2 was redrafted, in line with the corresponding text in the introductions to Test Series 1 and 2 in Part I of the manual, to make it clear that the substance should be tested in the form transported but that, if a mixture separates out, the initiator should be in contact with the most explosive part.

14. The specification for the steel in the BAM 50/60 tube was amended to St.37 and the option to instrument the USA gap test was removed. Only minor editorial amendments were made to the other tests. It was agreed that test results on self-reactive substances should be included in the Example of Results. Experts were requested to pass these to Dr Roberts by 31 January 1994.

15. The Series A version (to be test A.5 in United Kingdom document -/R.475) of the UN gap test proposed by the Netherlands in document -/R.399 was provisionally accepted but was retained in square brackets until laboratories had tried the test. The draft test prescription was altered to allow the use of Pentolite booster charges as agreed by the explosives experts in July. It was agreed that the test should be instrumented until experience had been gained with it. The expert from the United Kingdom agreed to draft criteria for the self-reactive substance / organic peroxide version of the UN Gap test.

Test Series B

16. It was agreed that text should be inserted in the test prescription for the Detonation in Package test to provide criteria for assessment of propagation velocity measurements.

Test Series C

17. The expert from the United States queried whether it was necessary to perform both the Time/Pressure test and Deflagration test. The expert from the United Kingdom considered that it was necessary as one test measured the rate of deflagration when the substance was confined and the other when unconfined. The rate of deflagration normally accelerates with pressure and this would not be identified by the unconfined test. The USA proposal to clarify the differences between the tests was accepted and the introductions to the tests amended accordingly. The USA indicated that they may submit a document, with test data on both organic peroxides and self-reactive substances, to support their contention that performance of the Time/Pressure test was not necessary. It was agreed that the USA proposal was a major change to the classification procedure and could only be made on the basis of a formal document.

18. The expert from the United Kingdom recognised the difficulties in transporting primed cambric (part of the ignition system) as a 1.3G substance. The expert from France suggested a type of packaging which would allow it to be shipped as 1.4S and the expert from the United Kingdom agreed to investigate this possibility. The expert from Sweden suggested that, from his experience with the liquid oxidizer test (INF. 6), it may be possible to use hot wire ignition.

Test Series D

19. Only minor editorial amendments were made. The expert from the United Kingdom agreed to check that the test prescription remained consistent with that of the corresponding 6(a) test in Part I.

Test Series E

20. It was agreed that for each test it would be better to refer to tube or disc rupture, where appropriate, rather than refer to explosion and to standardise on dibutyl phthalate as the liquid used to calibrate the heating rate. Some tests used unspecified silicone oil.

21. Germany is requested to investigate whether it was possible to simplify the Koenen test procedure by reducing the number of orifice plates used and by not recording information, such as the burning times and some of the fragmentation types, which is not used as part of the test criteria.

22. The expert from the Netherlands agreed to simplify the Dutch Pressure Vessel test by reducing the number of orifice plate sizes used and to provide diagrams of the modified pressure vessel and bursting disc assembly.

23. The expert from the United States agreed to simplify the USA Pressure Vessel test by reducing the number of orifice plate sizes used. It was agreed that some changes to the test prescription and method of expressing results was required and the expert from the United Kingdom agreed to modify the text in consultation with expert from the United States.

24. Some experts queried whether the thermal explosion vessel test should be retained in the manual as it still cannot be used for classification (see the introduction to Test Series E of the current manual). It was considered that the test represented a real improvement on the current tests but some design improvements and better criteria specifications were required. It was agreed that the test, which is given in the current manual (ST/SG/AC.10/11/Rev.1), should be deleted until the improvements are made.

25. The UN pressure vessel test, as proposed in Netherlands document -/R.400, was accepted in principle but, in order to restrict the variables involved in assessing the test, the following modifications were made:

- a cup (supplied by the expert from the USA) will be used to contain the sample in the pressure vessel;
- a 5 g sample will be used, except when testing against the "no" criterion when a 25 g sample will be used without a cup;
- for evaluation, heating rates of 0.5 ± 0.1 and 3.5 ± 0.5 K/s will be used to allow comparison of electrical/natural gas heating and butane/propane heating respectively; and
- the base of the pressure vessel will be modified to allow electrical heating.

The test will be inserted, in square brackets, as test E.5 in United Kingdom document -/R.475.

Test Series F

26. It was agreed that the Series F tests should be performed at ambient temperature unless the physical state is different from the substance transported. Text to this effect will be inserted.

27. Only minor changes were made to tests F.1, F.2, F.3 and F.5. A technical change was made to the Modified Trauzl test to allow inert substances to be used to correct for the effects of the detonator alone. The expert from the United Kingdom agreed to modify the text in consultation with the expert from the United States.

Test Series G

28. The test prescription for the Thermal Explosion in the Package test was modified to require that a clamping system be used to keep the package upright during the test. The expert from the United States indicated that there may be a difference between the results of the G.1 and G.2 test because of relatively rapid heating in the G.1 test and slow heating in the G.2 test. It was noted that the test result for 2,5-dimethyl-2,5-di-(tert.-butylperoxy)hexyne-3 indicated that this should be classified as a type B

rather than the current type C peroxide. An expert from CEFIC agreed to include a revision in their general document to the Committee on amendments to tables 11.3, 11.4, 11.5 and 14.1.

Test Series H

29. The expert from the Netherlands indicated that they would submit a document (to be -/R.477) for consideration at the ninth session of the Sub-Committee for revisions to Test Series H. The expert from the Netherlands will pay particular attention to revising the test criteria so that the tests will give equivalent results and will also provide a standard procedure for assessing the half-time of cooling of the packaged substance. The expert from Germany, via a CEFIC representative, indicated that improvements to the Heat Accumulation Storage test will be submitted. Experts from the countries of test origin agreed to supply example test results.

Introduction to Part III

30. As agreed by the Sub-Committee during their discussions on United Kingdom document -/R.436, the expert from the United Kingdom will modify the layout to reserve sections for each class not covered in Parts I and II of the manual. It was agreed that it was better to indicate which types of substances/articles were covered by Part III rather than those which were not.

Class 2

31. Section 31 was reserved for this class.

Class 3

32. All text in square brackets was accepted and the expert from the United Kingdom agreed to propose consequential amendments (to be given in document -/R.476) to chapter 5 of the Recommendations to harmonise the test prescriptions with the later versions given in the manual.

Class 4

33. All text in square brackets was accepted and the expert from the United Kingdom agreed to propose consequential amendments (to be given in document -/R.476) to chapter 5 of the Recommendations to harmonise the test prescriptions with the later versions given in the manual. The expert from Germany was asked to provide example test results for tests N.1 and N.5 and, experts from CEFIC, for tests N.2, N.3 and N.4.

Class 5: Division 5.1

34. There was a general discussion on the problems with the existing text. Most of the experts who had used the test had found that sawdust is difficult to define and, if obtained from different sources, leads to variable results.

In addition, problems have been encountered with the reference substances. Ammonium persulphate is self-reactive, i.e. it will react without a fuel, and the potassium perchlorate Packing Group II/III reference substance sometimes forms faster burning mixtures than the potassium bromate Packing Group I/II reference substance. On the basis of the French (-/R.471) and Japanese (INF. 9) documents, revised text for a solid oxidizer test is proposed in the annex to this report. This prescription is provided to allow laboratories to try the test. If the data obtained validates the test, the expert from France will submit a new document for consideration at the ninth session of the Sub-Committee with the revised test prescription and the supporting data. The expert from France agreed to supply the experts from Japan and the United States with the data and background information to the development of the revised test prescription. Most of the experts present agreed to try the test and exchange information as soon as possible.

Class 6

35. Section 35 was reserved for this class.

Class 7

36. Section 36 was reserved for this class.

Class 8

37. Section 37 was reserved for this class.

Class 9

38. The German document -/R.442 was compared with the draft text in document -/R.370 which included the option to use thermocouples to measure propagation. Points not addressed in the United Kingdom document were taken into account and the text amended accordingly. In particular, it was made clear that the NPK proportions were not necessarily a guide to whether self-sustaining decomposition will occur. The expert from Norway questioned how propagation rate was used and it was agreed that the references to this in the criteria should be removed.

Appendices

39. The expert from France supplied a method of cavitation using micro-balloons for inclusion in appendix 3.

Actions requested of the Sub-Committee

40. The Sub-Committee is requested to note this report and include it as an annex to the official report as a record of the principles underlying the agreed amendments to -/R.370 and of the outstanding actions.

41. The Sub-Committee is requested to agree the following time table for working groups during the next session:

(a) Plenary discussions on Class 1 matters, the manual and consequential amendments to chapter 4 of the Recommendations on Monday and Tuesday of the first week.

(b) Working Group on the General Introduction and Part I of the manual to meet Wednesday to Friday, including agreeing the report by the Working Group.

(c) On Monday of the second week, plenary discussions on the Working Group report followed by discussion of Parts II, III and the appendices to the manual and on the consequential amendments to chapters 5, 11 and 14 of the Recommendations.

(d) Working Group on Parts II and III of the manual to meet Monday to Wednesday and report to plenary on Thursday.

Annex to the Report of the Working Group

TEST METHOD FOR SOLID OXIDIZING SUBSTANCES

[34.4.1 Test O.1 TEST FOR SOLID OXIDIZING SUBSTANCES

34.4.1.1 Introduction

This test method is designed to measure the potential for a solid substance to increase the burning rate or burning intensity of a combustible substance when the two are thoroughly mixed. [Tests are conducted with the substance to be evaluated mixed with dry cellulose in two mixing ratios, namely a 50 to 50 sample-to-cellulose ratio and a 80 to 20 sample-to-cellulose ratio, both by mass.] The burning characteristics of each mixture are compared with the standard [60 to 40 mass ratio of barium nitrate to cellulose]. If the burning time is equal to or less than the [barium nitrate]
mixture, the burning times should be compared with those from the Packing Group I or II reference standards, [potassium bromate-cellulose mixtures in 50 to 50 and 30 to 70 ratios by mass respectively.]

34.4.1.2 Apparatus and materials

34.4.1.2.1 Technical pure [barium nitrate] and [potassium bromate] are required as reference substances. These substances should pass through a sieve mesh size smaller than 0.30 mm but larger than 0.15 mm and should not be ground. The reference substances are dried at 65°C for 12 hours and kept in a desiccator with desiccant for 24 hours or more at a temperature of 20°C ± 5°C.

34.4.1.2.2 Dried, fibrous cellulose [Whatman CF 11] is used as the combustible material which should have a fibre length between 50 and 350 μm. It is dried in a layer less than 25 mm thick at 105°C for 4 hours and kept in a desiccator with desiccant for 24 hours or more at a temperature of 20°C ± 5°C. The water content of the dried cellulose should be less than 0.5% by dry mass. If necessary, the drying time should be prolonged to achieve this.

34.4.1.2.3 An ignition source is required comprising of an inert metal wire (e.g. platinum or nickel/chromium) connected to an electrical power source and with the following characteristics:

(a)	Length	=	30 cm
(b)	Diameter	=	0.6 ± 0.05 mm
(c)	Electrical resistance	=	6.0 ± 0.5 Ω/m
(d)	Electrical power dissipated in the wire	=	150 ± 7 W

The wire should be shaped as in figure 34.4.1.1.

34.4.1.2.4 A sealed (at the narrow end) 60° glass funnel with an internal diameter of 70 mm is required to form the mixtures into a truncated conical pile with base diameter of 70 mm on a cool, impervious, low heat conducting plate. The plate should be 150 by 150 mm and have a thickness of 6 mm and a heat transfer coefficient (at a temperature of 0°C) of [86 cal/m.hr.°C] or less.

34.4.1.2.5 A fume cupboard or other kind of ventilated area is required in which there is some ventilation but with an air stream velocity of 0.5 m/s or less.

34.4.1.3 Procedure

34.4.1.3.1 30.0 g ± 0.1 g mixtures of the reference substances and cellulose are prepared in oxidizer-cellulose ratio of [60 to 40 for barium nitrate and 30 to 70 and 50 to 50 for potassium bromate], all by mass. 30.0 g ± 0.1 g mixtures of the substance to be tested, in the particle size in which it will be transported, and cellulose are prepared in [oxidizer-cellulose ratios of 50 to 50 and 80 to 20], both by mass. Each mixture should be mixed mechanically as thoroughly as possible without excessive stress.

34.4.1.3.2 Using the funnel, each of the mixtures should be formed into a truncated conical pile, with a base diameter of 70 mm, covering the looped ignition wire resting on the low heat conducting plate. The plate should be placed in a ventilated area and the test performed at atmospheric pressure with the ambient temperature 20°C ± 5°C and relative humidity 50% ± 10%.

34.4.1.3.3 Power is applied to the ignition wire and is kept on for the duration of the test. The burning time is recorded as the time from when the power is switched on to when the main reaction (flame or incandescence) ends. The test should be performed five times on the substance in each of the mixing ratios. Three tests should be performed with each reference mixture required to make the Packing Group assignment or to decide if the substance should not be classified in Division 5.1.

34.4.1.4 Test criteria and method of assessing results

34.4.1.4.1 The results are assessed on the basis of:

(a) the comparison of the mean burning time with those of the reference mixtures; and

(b) whether the mixture of substance and cellulose ignites and burns.

34.4.1.4.2 The test criteria for the determination of the oxidizing properties of the substance are:

[Packing Group I — any substance which, in the 50 to 50 or 80 to 20 sample-to-cellulose ratios tested, exhibits a mean burning time less than the mean burning time of a 50 to 50 mixture, by mass, of potassium bromate - cellulose.

Packing Group II	**any substance which, in the 50 to 50 or 80 to 20 sample-to-cellulose ratios tested, exhibits a mean burning time equal to or less than the mean burning time of a 30 to 70 mixture, by mass, of potassium bromate - cellulose and the criteria for Packing Group I are not met.**
Packing Group III	**any substance which, in the 50 to 50 or 80 to 20 sample-to-cellulose ratios tested, exhibits a mean burning time equal to are less than the mean burning time of a 60 to 40 mixture, by mass, of barium nitrate - cellulose and the criteria for Packing Groups I and II are not met.**
Not Division 5.1	**any substance which, in both ratios tested, does not ignite and burn, or exhibits a mean burning time greater than that of a 60 to 40 mixture, by mass, of barium nitrate - cellulose.]**

34.4.1.5 Examples of results

Note: The test results given should only be used as an illustration since the results obtained with a particular oxidizer will depend on the particle size etc.

Substance	**Mean burning times (s) for sample:cellulose ratio**		**Result**
	50:50 mixture	**80:20 mixture**	
Barium nitrate			
Potassium perchlorate			
Potassium bromate			

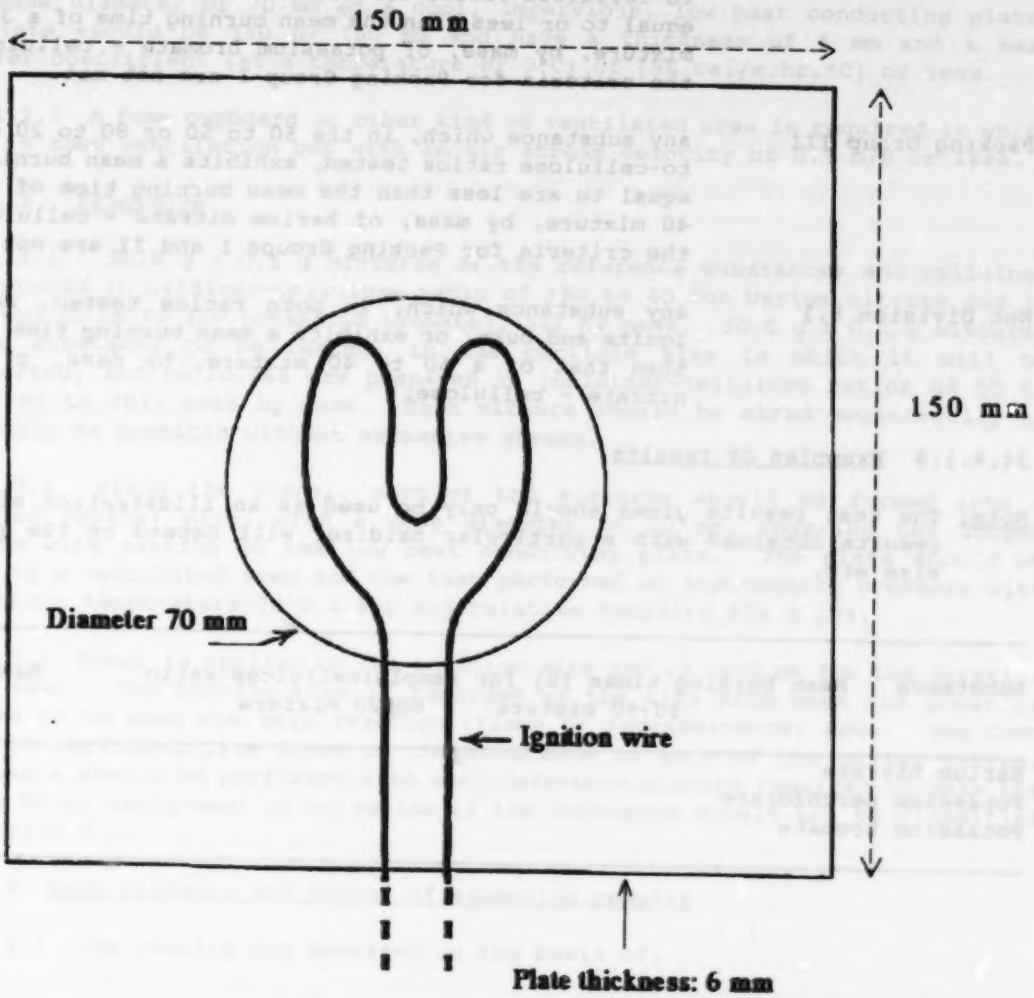

Figure 34.4.1.1 TEST PLATE AND IGNITION WIRE]

Annex 2

OBJECTIVE OF THE REVIEW OF CHAPTER 12 AND THE MULTIMODAL TANK TABLES

1. The objective is to consolidate existing tank construction and operating requirements pertaining to multimodal tanks in international service into a single set of recommendations which would address primarily the existing requirements and levels of safety currently applicable to multimodal tanks in various modal regulations.

2. The consolidated requirements should be suitable for incorporation into Chapter 12 of the Recommendations with the expectation that the consolidated requirements will eventually replace or be considered equivalent to all other requirements applicable to multimodal tanks in international service.

3. This work should initially focus on consolidation of the requirements for multimodal tanks intended to contain liquids and solids. Consolidation of requirements for multimodal tanks intended for gases should follow.

4. The primary documents for consideration include Chapter 12 of the Recommendations, Chapter 13 of the IMDG Code, United States requirements and the European requirements in the ADR and RID and any other relevant existing national documents. Document ST/SG/AC.10/C.3/R.422 comparing the existing requirements should be used as a basis for developing the consolidated text.

5. This effort should be directed primarily at the consolidation of existing requirements and levels of safety. Any new requirements should be considered only for significant safety aspects currently not included in existing modal regulations.

6. Where possible, redundant requirements should be eliminated from the consolidated text.

7. To achieve the goal of establishing internationally harmonized recommendations, representatives from appropriate regulatory bodies and certification agencies and from the affected industry should participate in the work.

8. Any working group contributing to the work should provide the Sub-Committee with a detailed report of its progress along with any recommended action for the Sub-Committee.

9. Proposals for new requirements and proposals for eliminating redundant requirements which could not be agreed upon by means of working groups should be addressed to the Sub-Committee in the form of written proposals. Consideration of a system of UN tank type numbering could follow from rationalized requirements for specific substances.

Annex 3

DRAFT AMENDMENTS TO THE RECOMMENDATIONS

Chapter 1: SCOPE OF THE RECOMMENDATIONS

1.17.1 Amend, at the end to read:

"..... as or more than air".

Chapter 2: LIST OF DANGEROUS GOODS MOST COMMONLY CARRIED

UN 1108 Amend the name to read: "1-PENTENE" and put "n-AMYLENE" into brackets as an alternative proper shipping name.

UN 1126 Change the name to read: "1-BROMOBUTANE"

UN numbers: 1133, 1210, 1263, 1267, 1268, 1308, 1544, 1556, 1557, 1583, 1588, 1601, 1602, 1655, 1759, 1760, 1863, 1866, 1903, 1935, 1989, 1993, 2024, 2025, 2026, 2059, 2430, 2570, 2735, 2788, 2810, 2811, 3140, 3142, 3143, 3144, 3145, 3146, 3287, 3288 and 3295: replace Special Provision "44" or "102" or "112", as the case may be, by "185" in column (b3).

UN 1139 Amend the name to read:

"COATING SOLUTION (includes surface treatments or coatings used for industrial or other purposes such as vehicle undercoating, drum or barrel lining)".

Change Special Provision to read "185".

UN 1150 Change the name to read: "1,2-DICHLOROETHYLENE"

UN numbers 1224, 1686 and 1987: Replace Special Provision "44" or "102", as the case may be, by "184" in column (b3).

UN 1230 Delete the alternative name "(METHYL ALCOHOL)"

UN 1279 Change the name to read: "1,2-DICHLOROPROPANE"

UN 1610 To be deleted.

UN 1611 Delete Special Provision "44" in column (b3) and add Packing Group "II" in column (c1).

UN 1695 Add the subsidiary risk "3" in column (b2).

UN 2037 Amend to read:

"2037 RECEPTACLES, SMALL CONTAINING GAS (GAS CARTRIDGES) without a release device, non-refillable"

UN 2211 Delete the amendment in Annex 2 to ST/SG/AC.10/C.3/14.

UN 2251 Change the name to read: "BICYCLO[2.2.1] HEPTA-2,5-DIENE, INHIBITED (2,5-NORBORNADIENE, INHIBITED)"

UN 2384 Change the name to read: "DI-n-PROPYL ETHER"

UN 2535 Change the name to read: "4-METHYLMORPHOLINE (N-METHYLMORPHOLINE)"

UN 2623 Delete Special Provision "102" in column (b3) and add Packing Group "III" in column (c1).

UN 2711 To be deleted.

UN 2801 Change Special Provision "184" to Special Provision "185".

UN 2938 To be deleted.

UN 3205 Add Special Provision "183" in column (b3)

UN 3206 Add Special Provision "182" in column (b3)
Add new entries:

(a1)	(a2)	(b1)	(b2)	(b3)	(c1)
"3303	COMPRESSED GAS, TOXIC, OXIDIZING, N.O.S."	2.3	5.1	109	
3304	COMPRESSED GAS, TOXIC, CORROSIVE, N.O.S."	2.3	8	109	
3305	COMPRESSED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S."	2.3	3 8	109	
3306	COMPRESSED GAS, TOXIC, OXIDIZING, CORROSIVE, N.O.S."	2.3	5.1 8	109	
3307	LIQUEFIED GAS, TOXIC, OXIDIZING, N.O.S."	2.3	5.1	109	
3308	LIQUEFIED GAS, TOXIC, CORROSIVE, N.O.S."	2.3	8	109	
3309	LIQUEFIED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S."	2.3	3 8	109	
3310	LIQUEFIED GAS, TOXIC, OXIDIZING, CORROSIVE, N.O.S."	2.3	5.1 8	109	
3311	GAS, REFRIGERATED LIQUID, OXIDIZING, N.O.S."	2.3	5.1	109	
3312	GAS, REFRIGERATED LIQUID, FLAMMABLE, N.O.S."	2.1		109	
3313	ORGANIC PIGMENTS, SELF HEATING	4.2		184	
3314	PLASTICS MOULDING COMPOUND in dough, sheet or extruded rope form evolving flammable vapour	9		207	III"

Chapter 3: SPECIAL PROVISIONS RELATING TO INDIVIDUAL SUBSTANCES AND ARTICLES

Special Provision

15 Amend to read:

"For small quantities of not more than 500g per package, this substance, with not less than 10% water, by mass, may also be classified in Division 4.1, subject to special provisions with respect to packaging."

18 Amend to read:

"For quantities of not more than 11.5kg per package, this substance, with not less than 10% water, by mass, may also be classified in Division 4.1, subject to special provisions with respect to packaging."

44)
102) To be deleted
112)

114 Amend to read:

"This substance may be carried in quantities of not more than 500 g per package."

145 Amend to read:

"Alcoholic beverages containing more than 70% alcohol by volume should be transported as substances of Packing Group II. Alcoholic beverages containing more than 24% but not more than 70% alcohol by volume should be transported as substances of Packing Group III. Other than for air transport, alcoholic beverages of Packing Group III, when carried in receptacles of 250 litres or less, are not subject to these Recommendations. Other than for air and sea transport, alcoholic beverages of Packing Group II, when carried in receptacles of 5 litres or less, are not subject to these Recommendations."

Chapter 6: SPECIAL RECOMMENDATIONS RELATING TO CLASS 6

Section 6.6:

Delete the existing section 6.6 and insert into square brackets the following new text:

"[6.6 **Methods for determining oral and dermal toxicity of mixtures**

6.6.1 When classifying and assigning the appropriate packing group to mixtures in Division 6.1, in accordance with the oral and dermal toxicity criteria in 6.4.1, it is necessary to determine the acute LD_{50} of the mixture.

6.6.2 If a mixture contains only one active substance, and the LD_{50} of that constituent is known, in the absence of reliable acute oral and dermal toxicity data for rats on the actual mixture to be transported, the oral or dermal LD_{50} may be obtained by the following method:

$$LD_{50} \text{ value of preparation} = \frac{LD_{50} \text{ value of active substance} \times 100}{\text{percentage of active substance by mass}}$$

6.6.3 If a mixture contains more than one active constituent, there are three possible approaches that may be used to determine the oral or dermal LD_{50} of the mixture. The preferred method is to obtain reliable acute oral and dermal toxicity data for rats on the actual mixture to be transported. If reliable, accurate data is not available, then either of the following methods may be performed:

(a) Classify the formulation according to the most hazardous constituent of the mixture as if that constituent were present in the same concentration as the total concentration of all active constituents; or

(b) Apply the formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

where: C = the % concentration of constituent A, B ... Z in the mixture

T = the oral LD_{50} values of constituent A, B ...Z

T_M = the oral LD_{50} value of the mixture.

Note: This formula can also be used for dermal toxicities provided that this information is available on the same species for all constituents. The use of this formula does not take into account any potentiation or protective phenomena."]

Paragraph 6.9 (a) Revise the last sentence in the "Infectious substances" definition to read:

"However, they are not subject to the recommendations for this division if they are unlikely to cause human or animal disease."

Paragraph 6.13.1 Amend to read:

"6.13.1 Inner packagings containing infectious substances should not be consolidated with inner packagings containing unrelated goods."

Paragraph 6.13.5 Insert a new sub-paragraph (b) as follows:

"(b) The code designating the kind of packaging according to the provisions of 9.4."

Renumber the existing sub-paragraphs (b) to (e) as sub-paragraphs (c) to (f).

Paragraph 6.13.6 Amend the example to read:

"4G/Class 6.2/..."

Paragraph 6.14.4 (b) Amend to read:

"(b) The sample should be subjected to a water spray that simulates exposure to rainfall of approximately 5 cm per hour for at least one hour. It should then be subjected to the test described in (a)."

Paragraph 6.14.8 (Existing 6.14.7, renumbered 6.14.8 at the 7th session)

Amend the second sentence to read:

"Such waste should be transported in rigid, leakproof packagings or IBCs, in accordance with the provisions of Chapters 9 or 16 for solids, at the Packing Group II performance level, provided there is sufficient absorbent material to absorb the entire amount of liquid present and the packaging is capable of retaining liquids."

Paragraph 6.14.9 Add a new paragraph 6.14.9 to read:

"6.14.9 Inner receptacles of any type may be assembled within an intermediate (secondary) packaging and transported without testing in the outer packaging under the following conditions:

(a) The intermediate/outer packaging combination should have been successfully tested in accordance with 6.14.4 with fragile (e.g., glass) inner receptacles;

(b) The total combined gross mass of inner receptacles should not exceed one half the gross mass of inner receptacles used for the drop test in (a) above;

(c) The thickness of cushioning between inner receptacles and between inner receptacles and the outside of the intermediate packaging should not be reduced below the corresponding thicknesses in the originally tested packaging; and if a single inner receptacle was used in the original

test, the thickness of cushioning between inner receptacles should not be less than the thickness of cushioning between the outside of the intermediate packaging and the inner receptacle in the original test. When either fewer or smaller inner receptacles are used (as compared to the inner receptacles used in the drop test), sufficient additional cushioning material should be used to take up the void;

(d) The outer packaging should have successfully passed the stacking test in 9.7.6 while empty. The total mass of identical packages should be based on the combined mass of inner receptacles used in the drop test in (a) above;

(e) For inner receptacles containing liquids, an adequate quantity of absorbent material to absorb the entire liquid content of the inner receptacles must be present;

(f) If the outer packaging is intended to contain inner receptacles for liquids and is not leakproof, or is intended to contain inner receptacles for solids and is not siftproof, a means of containing any liquid or solid contents in the event of leakage should be provided in the form of a leakproof liner, plastics bag or other equally effective means of containment;

[(g) In addition to the markings prescribed in 6.13.5 (a) to (e), packagings should be marked in accordance with 6.13.5 (f)]".

Chapter 8: SPECIAL RECOMMENDATIONS RELATING TO CLASS 8

Paragraph 8.4 (b) Add the following:

"An acceptable test is prescribed in ASTM G31-72 (Reapproved 1990)".

Chapter 9: GENERAL RECOMMENDATIONS ON PACKING

paragraph 9.3.11 Amend to read:

"An empty packaging that has contained a dangerous substance should be treated in the same manner as is required by these recommendations for a filled packaging, unless adequate measures have been taken to nullify any hazard."

Paragraph 9.4.3 Amend to read:

"In the case of combination packagings and packagings described in 6.13, only the code number for the outer packaging should be used."

Paragraph 9.7.2.5 Amend the first sentence to read:

"9.7.2.5 Steps should be taken to ascertain that the plastics materials used in the manufacture of plastics drums, plastics jerricans and composite packagings (plastics materials) intended to contain liquids complies with the provisions in 9.3.2, 9.6.7.1 and 9.6.7.4."

Chapter 12: RECOMMENDATIONS ON MULTIMODAL TANK TRANSPORT

Amend the existing entries in Chapter 12, if necessary, in accordance with the amendments to Chapter 2.

Table 12.1

For the entry UN 3252 delete the existing pressures in column (5) and replace with the following:

(5)	"43.0 39.0 34.4 30.5"

Table 12.2

UN 1224) Delete superscript "4" after the name.
UN 1987)

Amend the entries for UN 2801 to read:

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
"2801	Dyes, liquid, corrosive, n.o.s. or	8/I	-	4	12.5.2	A/12.7.3	N.	12.22.3
	Dye intermediates, liquid corrosive,	8/II		4	12.5.2	A/12.7.3	N.	12.22.3
	n.o.s.	8/III		2.65	12.5.2	A/12.7.2	N.	2.22.3"

Chapter 16: RECOMMENDATIONS ON INTERMEDIATE BULK CONTAINERS (IBCs)

Paragraph 16.1.2.1 Delete the term "semi-rigid".

Table 16.1.2.2.1 Delete the term "semi-rigid" and the relating codes in the table.

Paragraph 16.1.6.6 Amend to read:

"An empty IBC that has contained a dangerous substance should be treated in the same manner as is required by these recommendations for a filled IBC, unless adequate measures have been taken to nullify any hazard."

Paragraph 16.4.8.1: Amend to read:

"16.4.8.1 Steps should be taken to ascertain that plastics materials used in the manufacture of rigid plastics IBCs types 31H1 and 31H2 complies with the provisions of 16.4.3.1 to 16.4.3.4."

Paragraph 16.5.8.1: Amend to read:

"16.5.8.1 Steps should be taken to ascertain that the plastics materials used in the manufacture of composite IBCs types 31HZ1 and 31HZ2 complies with the provisions of 16.5.3.2.1 to 16.5.3.2.4."

APPENDIX

Amend the Appendix,if necessary, in accordance with the amendments to Chapter 2.

INDEX

1. Amend the existing entries in the Index and add new entries in accordance with the amendments to Chapter 2.

2. In addition add the following entries in the Index:

"n-Butyl bromide, see		3	1126"
"Methyl alcohol, see		3	1230"
"Propylene dichloride, see		3	1279"

3. Add R numbers as cross references in the Index as follows:

" R12,	see	2.2	1028
		2.2	2602
R12B1,	see	2.2	1974
R13,	see	2.2	1022
		2.2	2599
R13B1,	see	2.2	1009
R14,	see	2.2	1982
R21,	see	2.2	1029
R22,	see	2.2	1018
R23,	see	2.2	1984
		2.2	2599
R40,	see	2.1	1063
R41,	see	2.1	2454
R114,	See	2.2	1958
R115,	see	2.2	1020
R116,	see	2.2	2193
R124,	see	2.2	1021
R125,	see	2.2	3220
R133a,	see	2.2	1983

R134a,	see	2.2	3159
R142b,	see	2.1	2517
R143a,	see	2.1	2035
R152a,	see	2.1	1030
		2.2	2602
R161,	see	2.1	2453
R218,	see	2.2	2424
R227,	see	2.2	3296
R500,	see	2.2	2602
R503,	see	2.2	2599
R1132a,	see	2.1	1959
R1216,	see	2.2	1858
R1318,	see	2.2	2422
RC318,	see	2.2	1976

TESTS AND CRITERIA (ST/SG/AC.10/11/Rev.1)

Delete the following tests from Part I of the Manual for Tests and Criteria:

- Test 1 (b) (iii), SCB Test paragraphs 11.5.2 through 11.5.2.5 and Figure 11.5.2.1

- Test 2 (b) (ii), SCB Test paragraphs 12.5.2 through 12.5.2.5 and Figure 12.5.2.1

- Test 3 (b) (iii), ABL Friction Test paragraphs 13.5.3 through 13.5.3.5 and Figure 13.5.3.1